A good map of the territories around the Yellowstone region, and a large scale-map of the Upper and Lower Geyser Basins, enable the reader to follow the author in his wanderings and descriptions.

From a scientific point of view Mr. Lamont's book is more valuable than the one we have been speaking about. So long ago as 1858-59, Mr. Lamont made voyages, mainly for sport, to the Spitzbergen Arctic region; and in 1869-70-71 he made other three voyages. In the volume before us he has brought together some of the most valuable results of his observations during these voyages, and while devoting considerable space to his sporting adventures with the walrus, the seal, and the bear, he gives much information of scientific value. His sporting skill stood him in good stead, as from his large takes of walruses, seals, and bears, not to mention reindeer and smaller game, he must have been, in 1869 at least, considerably recouped for the expenses of his voyage.

Mr. Lamont, very naturally judging from his own success, is inclined to place more value on private Arctic enterprises than on elaborately equipped Government exploring expeditions. He refers to the expedition in the *Polaris*, commanded by a civilian, and which got further north than any ship had previously done. But we think that any one who reads the narrative of that unfortunate expedition unprejudicedly, must conclude that had the expedition been under strict naval discipline it would have reached a point still further north, would have accomplished more in the way of scientific observation than it did, and would not have ended with the disaster that befell it. The last Payer-Weyprecht expedition, though not a Government one, was practically under naval discipline, and the English Government expeditions referred to by Mr. Lamont, did not fail in their endeavours to push northwards because they were such. But Mr. Lamont speaks as if the main object of Arctic exploration were to get as far north as possible, whereas, in the eyes of scientific men, this is a point of minor importance; and they maintain rightly, we think, and their opinion is supported by past experience, that no Arctic expedition can be adequately equipped to collect all the scientific data which can be so abundantly obtained in these regions, unless it be sent out by Government and be conducted with all the method and strictness which naval discipline alone can enforce. Private enterprises like those of Mr. Lamont and the whale fishers, can do much to add to our knowledge of the Arctic regions, but if we had had to depend entirely on such means, what would have been the amount and value of our knowledge at the present day?

Mr. Lamont gives a minute description of the construction of his admirably built steam yacht the *Diana*, which came unscathed through many dangers. In 1869 he sailed as far as the Kara Straits, which he did not enter. Next year, however, he passed through Pet or Jugor Straits, and penetrated a short distance into the Kara Sea, coming out by the Kara Straits. He sailed up the west side of Novaya Zemlya as far as Admiralty Peninsula, and after several trials succeeded in passing through the Matoschkin Schar. He landed on several points of the island, and gives some valuable notes on the fauna and flora which he observed. In 1869 he sailed along the edge of the ice-pack a little north of the 75th degree of latitude, to Spitzbergen, the coasts and gulfs and islands of which in his various voyages he has examined with great minuteness, and contributes several notes on the physical geography and natural history, which will be found of value as supplementary to those of other observers. Regular temperature soundings were taken and the surface-temperature observed, the condition and movements of the ice noted, especially in the Kara Sea, as well as any evidences of currents; and Mr. Lamont's observations on these points, and especially on the movements of the ice in the Kara Sea, we would recommend to the notice of all interested in Arctic physics and Arctic geography. Mr. Lamont has a right to be considered an experienced Arctic observer, and his opinions should be received with respect. Years ago he conjectured that land should be found to the north between Spitzbergen and Novaya Zemlya; the Payer-Weyprecht Expedition has confirmed this conjecture. He tried hard to get at least a sight of Wiche's Land, but failed, though the Norwegian captains succeeded in reaching it in 1872; for there is no doubt that Petermann's King Karl Land is that discovered by Edge 250 years ago. Mr. Lamont thinks it possible that it may be connected with the recently-discovered Franz Josef Land.

Mr. Lamont records not only his own observations, but being well up in the literature of the exploration of the region he visited, gives many valuable notes of the work done by previous explorers, as well as by some who have been there since his last voyage. We would recommend to naturalists his observations on the differences between the reindeer of Spitzbergen and that of Novaya Zemlya; the former he thinks identical with the wild and tame deer of Norway and Lapland, whereas the Novaya Zemlya type appears to him more allied to the reindeer of the American Continent. His theory as to the migration of the Spitzbergen type is very remarkable.

There are many illustrations throughout the work, some of them not well drawn, but all of them helping the reader to realise what is to be seen in the regions to which they refer. Various maps and outlines of coasts add to the value of the work, which we assure our readers they will find full of entertainment and information.

OUR BOOK SHELF

Die Neuere Schöpfungsgeschichte nach dem gegenwärtigen Stande der Naturwissenschaften. By Arnold Dodel, Privat-docent at Zürich. (Leipzig: Brockhaus, 1875.)

ANOTHER work on Evolution, equalling the "Origin of Species" in size. The author of these twelve lectures has carefully studied every important work on the subject, and endeavours to give a plain and intelligible account of Evolution in relation to the whole field of biology. The style of the work is vigorous and combative, and considerable success in exposition is attained. But many definite conclusions are announced where the most far-seeing evolutionists would only put forward tentative hypotheses. We think it will be far more advantageous for German or other students who have any real knowledge of biology to study for themselves Mr. Darwin's works than to take a less efficient, though an honest and accomplished guide in Dr. Dodel. The book is well illustrated with engravings of interesting structures in plants and animals bearing on Evolution; it also contains a

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number of hypothetical scenes illustrating the fauna and flora of the past, as well as several phylogenetic trees.

Le Valhalla des Sciences Pures et Appliquées, galerie commémorative et succursale du conservatoire des Arts et Métiers de Paris, a créer dans le Palais Neuf de Mansart, au Château de Blois. Par le C$^{\text{te}}$. Léopold Hugo. (Paris, 1875.)

THE four names of Watt, Fulton, Stephenson, and Denis Papin, inscribed on the roof of the railway station at Blois, suggest a train of thought to the author in connection with the triumphs of steam and its applications. Having previously described the Château de Blois, the writer puts forward a proposal (sometimes he calls it a dream) to turn the now abandoned château into a noble valhalla of science. A principal feature is a statue of Papin (born at Blois about 1650); there should be also statues of other scientific writers of all time and climes, appropriate inscriptions, portraits on the walls, and representations of interesting scenes in the history of science, chambers for the exhibition of models and instruments, a scientific library, and other matters. So his dream is to make this a Versailles of science. A classification of the sciences and a plan close this part of the pamphlet. We do not, however, concern ourselves here with this proposal or dream or whatnot, but pass on to a brief glance at the three appendices. The first is "Définition de la double-tendance Philosophique de la Science." Noting the objects the "immortal" Bacon had in view in his New Atlantis, he applies himself to the consideration of what is the classification that we can make of the sciences, and combats Auguste Comte's arrangement according to the increasing complexity which appears inherent in them. In our author's eyes all sciences have the same complex character (caractère de complication) either virtually or actually. Comte begins with mathematics, Hugo exalts them to a high place: "L'intérêt philosophique des sciences mathématiques est de marcher à la rencontre des sciences naturelles. Il n'y a rien là qui ressemble à une subordination des certaines sciences." The second is "Examen géométrique sommaire des orbites planétaires (ovhélites)." The writer remarks that recent discoveries in Astronomy have pointed to a new movement of the solar system in space, hence the orbit or trajectory of our planets is not a plane curve. This orbit is a helicoidal curve with an elliptical or oval projection. Hence ov-hél-ite. In the geometrical description of such a curve we must indicate whether the trace is *dextrorsum* or *sinistrorsum*. The ovhélites of the planets and of the earth are geometrically traced *sinistrorsum*. In this paper, which was originally communicated to the Mathematical Society of Paris, the author states the theorem "Les ovhélites planétaires sont tracées sur les cylindres à section droite elliptique (sauf perturbation) ou du moins ovalaire. Une des lignes focales des susdites ovhélites est commune; cette ligne est la trajectoire solaire." The third appendix is "Base scientifique de la numération décimale." We will again let the Count speak for himself, "Je propose aujourd'hui d'utiliser une des plus anciennes et des plus curieuses théories de la géométrie, restée jusqu'à ce jour sans emploi, pour établir un lien entre la géométrie et l'arithmétique, en donnant comme base à cette dernière science un *nombre absolu et éternel*." The five regular solids were treated of by Pythagoras. Cauchy and Poinsot have added to these four stellated polyhedra. "En y joignant à mon tour la sphère (qui est le régulier infinioïdique) j'arrive à constituer géométriquement le nombre infranchissable de DIX." Thus we see there is a resemblance between the nine digits and zero on the one hand and the nine regular polyhedra and the sphere on the other. Further, there is a curious feature, there are five primes among these, and there are five regular convex solids. Such then is "la conception philosophique et vraiment scientifique du nombre fondamental DIX." After two thousand years we have arrived at an application of the theory of the regular figures, there is hope also of establishing a rival to Euclid. A commission was appointed in March of last year to pronounce upon the Hugodecimal theory. "De la propriété régulière essentielle de l'espace, de l'absolu régulier, avoir fait jaillir le nombre DIX!" These are the principal points of interest in the pamphlet.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

The Article "Birds" in "Encyclopædia Britannica"

IN reply to Prof. Huxley's letter of last week with reference to my review of the article "Birds" in the "Encyclopædia Britannica," I may mention that it is to the illustrious Nitzsch, as far as I am aware, that we owe the combination of the Swifts and the Humming Birds into a single family. Burmeister's edition of Nitzsch's "Pterylography" was published in 1840, and in Mr. Sclater's translation of that invaluable work (p. 86) we read, under the heading MACROCHIRES, "In this family I place the two genera, *Cypselus* and *Trochilus*, which indeed present but little external similarity, but are very nearly allied in the structure of their wings."

In 1867, the year in which Prof. Huxley promulgated his Classification of Birds, the palatal structure of the Humming Birds was imperfectly known, as may be gathered from the following passage in his memoir* with reference to the Cypselomorphæ:—"The vomer is truncated at the anterior end, and the maxillo-palatines are slender and disposed nearly as in the typical Coracomorphæ (*? Trochilus*)." I believe that, at that time, no accurate account of it had been given by anyone.

When, in 1873, after I thought that I had fairly mastered Prof. Huxley's classification, Mr. Parker kindly informed me verbally that from his investigations on the subject he had discovered that the vomer of the Trochilidæ is sharp-pointed instead of being truncated. Upon re-reading Prof. Huxley's data for his division of Carinate birds in the Schizognathæ and the Desmognathæ, in both which groups the vomer is *pointed* (or not ossified), and the Aegithognathæ, in which the vomer is *truncated*, I naturally was led to see, as Mr. Parker has since stated in print,† that the Trochilidæ are not Aegithognathous, but Schizognathous; and I further inferred, justly I believe, that if Prof. Huxley had, in 1867, known that the vomer of the Humming Birds is sharp-pointed instead of being truncated, he would never have placed the Trochilidæ among the Aegithognathæ, for in so doing he would have been compelled to have given up the only common character of any importance which links together that group. When, therefore, I say in my review that "Professors Huxley and Parker place them [the Swifts and the Humming Birds] in quite different divisions," there can be no objection to my including Prof. Huxley's name with that of Mr. Parker in a *general* remark which is so fully borne out by the spirit of the classification introduced by the first and adopted by the second of these illustrious biologists.

That Prof. Huxley did, in 1867, adopt Nitzsch's combination of the Swifts with the Humming Birds, I would not attempt to deny, but *then* the palatal structure of the latter sub-family was not correctly known.

10, Harley Street A. H. GARROD

The Difficulties of the Public Analysts

HAVING for some time past watched with painful interest the prosecutions under the new Adulteration Act, and seeing very clearly that whatever may be its success or failure in reference to its intended object, this Act of Parliament is becoming eminently successful in bringing chemical science into contempt, I am glad to see that you have taken up the subject in the columns of NATURE. I hope that it will be freely discussed. It may be safely affirmed that in the majority of cases where the vendor has made an effort to defend himself he has been able to flatly and positively contradict the certificate of the public analyst by counter-certificates of other analysts of equal or superior eminence. The butter case you have quoted is no exception, but may be taken as about a typical or average sample of such prosecutions. If this deplorable state of things is to continue,

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* Proc. Zoolog. Soc. 1867, p. 468.

† Trans. Zoolog. Soc. vol. ix. p. 292.

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